Year 11 Unit 2 Overview

Target grade for tests:

You will learn about:

- **Direct and inverse proportion**
- **Arithmetic and Geometric sequences**
- **Surface area and volume of spheres, pyramids, cones and composite solids**
- **Roots, intercepts, turning points and quadratic functions**
- **Compound interest, growth and decay**

Lesson Overview

DIRECT AND INVERSE PROPORTION

- Recognise a graph that illustrates direct proportion
- Recognise a graph that illustrates inverse proportion
- Interpret a graph that illustrates direct proportion
- Interpret a graph that illustrates inverse proportion
- Understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y
- Interpret equations that describe direct proportion
- Interpret equations that describe inverse proportion
- Solve problems which include finding the multiplier in a situation involving direct proportion
- Solve problems which include finding the multiplier in a situation involving inverse proportion

SEQUENCES

- Understand the difference between an arithmetic progression, a quadratic sequence and a geometric progression
- Recognise a simple geometric progression
- Find the next three terms in a geometric progression
- Find a given term in a simple geometric progression
- Describe a geometric progression

SURFACE AREA AND VOLUME

- Know the formula for the surface area of a sphere (curved surface area of a cone)
- Use Pythagoras' theorem to find lengths in a pyramid
- Find the surface area of a sphere (cone, pyramid)
- Identify how to find the surface area of a composite solid
- Solve practical problems involving the surface area of solids
- Know the formula for the volume of a sphere (cone, pyramid)
- Find the volume of a sphere (cone, pyramid)
- Identify how to find the volume of a composite solid
- Solve practical problems involving the volume of solids

QUADRATIC GRAPHS

- Identify (interpret) roots of quadratic functions graphically
- Identify (interpret) intercepts of quadratic functions graphically
- Identify (interpret) turning points of quadratic functions graphically

COMPOUND INTEREST, GROWTH AND DECAY

- Recognise when a situation involves compound interest
- Set up a compound interest problem
- Calculate the result of a repeated percentage change, including compound interest
- Set up a growth or decay problem
- Solve problems involving growth and decay

Key Words
Refer to
http://studymaths.co.uk/glossary.php
for definitions of the key words

Direct proportion
Inverse proportion
Multiplier

Notation
$\propto$ - 'proportional to'

Term
nth term
Generate
First (second) difference
Geometric Progression

Notation
T(n) is often used to indicate the 'nth term'

(Composite) solid
Sphere, Pyramid, Cone
Perpendicular (height), (slant height)
Surface area
Volume

Notation
π
Abbreviations of units in the metric system: km, m, cm, mm, mm^2, cm^2, m^2, km^2, mm^3, cm^3, km^3

Function, equation
Linear, non-linear
Quadratic, cubic, reciprocal
Parabola, Asymptote
Gradient, y-intercept, x-intercept, root

Notation
$y = mx + c$

Fraction
Mixed number
Top-heavy fraction
Percentage change, percentage increase, percentage increase
Compound interest, Simple interest
(Exponential) growth, decay